OUTREACH

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New Centres of Excellence Established

Replication of E-Bario project in Terengganu, Pahang, Sabah and Sarawak

TechnoFund for Sago Starch-to-Ethanol Conversion Process

Aquaculture Potential of Razor Clams

iCompetent: Recruiting the best-suited employee for the job

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Introduction

In this age of globalization, the role played by universities as centres of knowledge production is rapidly changing. Universities can no longer be impermeable to the environment beyond their walls. Under conditions of rapid socio-economic transformation in the 21st century, it has become increasingly evident that research in universities has to be more client-oriented. Indeed, partnerships with industry, government agencies and the community at large are not only inevitable but highly desirable. Research and teaching in academia will be enriched and broadened by real life issues and experiences while industry, government and the wider community can tap the previously inaccessible expertise in the universities. It is with this in mind that it gives me great pleasure to see the inaugural publication of OUTREACH, UNIMAS Research Bulletin. We have a vibrant community of researchers and academics who are involved in cutting-edge research and it is in OUTREACH that we showcase our research endeavours, the design and development of new products and technologies. Through OUTREACH, we hope to let others know our research niche areas and the expertise available in UNIMAS. In this way, alliances and partnerships with industry, government and the community can be built for the promotion of a knowledge-based society.

TABLE OF CONTENTS

BASIC FACTS & FIGURES ABOUT UNIMAS

Date established (incorporated)	24th December 1992.	
Campus Site	Kota Samarahan, Sarawak, Malaysia (about 25 km from Kuching, the capital city of Sarawak)	
Present Vice Chancellor	Prof Datuk Dr Abdul Rashid Abdullah	
Student's enrolments – 2007/2008	Undergraduate	7,524
	Post-graduate	732
	Total	8,256
	Breakdown of Postgraduate Students	
	Masters by Research	239
	Masters by Coursework	421
	Ph.D	72
Staff Population (full-time) (as of June 2007)	Academic	606
	Management	94
	Support	848
	Total	1,548

Faculties

Faculty of Applied and Creative Arts
Faculty of Cognitive Sciences and Human Development
Faculty of Economics and Business
Faculty of Engineering
Faculty of Computer Science and Information Technology
Faculty of Medicine and Health Sciences
Faculty of Resource Science and Technology
Faculty of Social Science

Centres

Centre for Language Studies
Centre for Academic Information Services
Centre for Student Development
Centre for Technology Transfer and Consultancy
Centre for Information and Communication Technology Services
Research and Innovation Management Centre

Institutes

Institute of Biodiversity and Environmental Conservation
Institute of East Asian Studies
Institute of Health and Community Medicine (IHCM)

Centres of Excellence

The Malaria Research Centre
The Centre for Water Research
Rural Informatics
Image Analysis and Spatial Technologies

International Linkages

54 international partners worldwide

Centre for Academic Information Services (CAIS)

As at April 2007, CAIS has the following:

Volumes of Books	121,951
Sets of Media Materials	8,036
Journals Titles (Print and Electronic)	18, 458

Congratulations and best wishes to 1565 graduating students of UNIMAS who will be recieving their scrolls and awards at the 11th UNIMAS CONVOCATION, 4 - 5 August 2007.

RESEARCH NEWS IN BRIEF

Researchers of the Year

UNIMAS celebrated the achievement of academics with exceptional research output during the Research Award Night 2007 on February 26. Cash prizes and certificates were presented to 13 academics. The Best Researcher Award was won by Associate Professor Dr Wang Yin Chai, and Puah Chin Hong was awarded the Young Researcher Award. The Highest International R&D Grant Recipients were Professor Dr Mary Jane Cardosa and Professor Dr Balbir Singh who between them secured a total of RM5.2 million of research grants. In the International R&D Exhibitions category, Dr Nazlina Shaari emerged as the winner.

Centres of Research Excellence

At the Research Award Night 2007, two Centres of Excellence status were established in recognition of their contribution of two research groups to the advancement of knowledge in their fields.

The Centre for Excellence for Image Analysis & Spatial Technologies, anchored at Faculty of Computer Science and Information Technology, has Associate Professor Dr Wang Yin Chai as its first Director. This research group has acquired 8 grants totaling RM2,816,000, published 75 papers, produced 10 commercialisable projects, and trained as many as 27 Masters and Ph.D students since the year 2000. Nine consultancy projects so far has utilised the much sought-after GIS expert tool. The latest commercialisable products is on the integration of GIS and sensory devices in flood management for emergency response.

Centre for Excellence for Rural Informatics (CoERI). The eBario project leader, Professor Dr Khairuddin Ab Hamid has been appointed CoERI's first Director and the Centre is anchored at the Faculty of Computer Science and Information Technology. Since its inception in 1999, the eBario group has secured a total grant amounting to RM4,972,967. It has won nine national and international awards, and generated 50 research papers. The eBario project won the Gold Medal from among 112 entries from all Commonwealth countries at the Commonwealth Association of Public Administration and management (CAPAM) International Innovations Awards in Sydney in October 2006.

"Best of the Best" Award

The creativity of UNIMAS researchers was officially recognised at the Malaysian Technology Exhibition 2007 (MTE 2007) on March 29-31 with the winning of the "Best of the Best" award, 4 gold, 3 silver and 6 bronze medals for the 14 products exhibited. The "Best of the Best" award went to the mobile emergency kit for paramedic and rescue team put together by Musdi Bin Hj. Shanat. The gold medalist products included the compact rescue stretcher, unmanned underwater search craft, and magic finger (an intelligent hand-free input device).

UNIMAS embarking on Zoonoses Research

The recent emergence and re-emergence of zoonotic diseases (e.g. JE, Hendra, and Nipa viruses; malaria) in Malaysia underscores the urgent need to understand the complex mechanisms that directly impact on the infection of indigenous wildlife species, and possible transmission to humans. A multi-disciplinary research group comprising 14 researchers from UNIMAS and external collaborators, led by Associate Professor Dr Tajuddin Abdullah, is applying for funding from the Ministry of Higher Education (MOHE). Through this research, the group hopes to provide answers to many long-standing questions on the occurrence of local outbreaks due to wildlife diseases for the promotion of better health care.

RM4 million to replicate e-Bario

In view of eBario's success and international acclaim for the innovative application of ICT to sustain social and economic development in rural communities, the eBario team was invited by the Ministry of Science, Technology and Innovation (MOSTI) to put forward an application for the Demonstrators Application Grant (DAG) Scheme. A total research funding of RM4 million was awarded for the team to replicate the eBario project in five remote sites, one each in Trengganu, Pahang, Sabah and two sites in Sarawak. The grant will enable the rural informatics group to research into the replicability and the upscaling of the project, and identify new models of deploying ICT technology to other remote communities throughout Malaysia.

Normah Foundation Research Award

En Tan Cheong Huat, a UNIMAS post-graduate student at the Faculty of Medicine & Health Sciences has recently received a special support grant worth RM10,000.00 from the Normah Medical Foundation Charitable Trust Board for a highly specialised research on malaria. The research project

Cont'd from page 3

pursued by Tan, "Identification of vectors of *Plasmodium knowlesi* and studies on their bionomics in Sarawak" involves identification of the mosquito vectors of *P. knowlesi* through cloning and DNA sequencing of the *Plasmodium* sp. circumsporozoite (csp) and SSU rRNA genes extracted from mosquito species found in Sarawak

UNIMAS welcomes 1944 new students for the 2007/8 academic session to this great campus and wishes them the best in their studies and life on campus.

HIGHLIGHTS OF RESEARCH PROJECTS

Hand, Foot and Mouth Disease in Sarawak - Need for New Diagnostic Technologies for Rapid Detection and Identification of Virus

Project Leader: Professor Dr. Mary Jane Cardosa
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UNIVERSITI MALAYSIA SARAWAK
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The Institute of Health & Community Medicine (IHCM), UNIMAS, has been assisting the Sarawak Health Department (SHD) in investigating HFMD outbreaks since 1997 when a large outbreak in Sarawak occurred coincidentally with a second virus leading to about 30 deaths of children in the state. The HFMD outbreak in 1997 was found to be due to human enterovirus 71 (EV71) and this was the first recognition of EV71 in Malaysia. Following this outbreak, the Director of Health of Sarawak (Tan Sri Datu Dr Mohd Taha Arif, currently Dean of UNIMAS Faculty of Medical and Health Sciences) requested that IHCM work closely with the SHD to set up a sentinel surveillance programme to study the characteristics of HFMD in Sarawak in general, and more specifically to understand the dynamics of EV71 transmission in order to provide early warning of impending outbreaks. This surveillance programme began in March 1998 and continues to the present. The findings of the first 7 years have recently been jointly published by UNIMAS and SHD authors in an international peer reviewed open access journal and can be accessed at:

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Retrieve&dopt=AbstractPlus&list_uids=16827926&query_hl=14&itool=pubmed_docsum

In summary, this surveillance programme has found the following:

- EV71 outbreaks have occurred every 3 years in Sarawak – 1997, 2000, 2003 and at the time of writing we predicted an outbreak in 2006, and this did indeed occur.
- The shape of the HFMD epidemiological curves are influenced by social factors such as the media and people's movements during big public holidays (especially Gawai).

- EV71 is not the only virus associated with HFMD (other viruses include Coxsackievirus A16, Coxsackievirus A10, etc) but only EV71 causes very large outbreaks.
- The genogroups of the EV71 isolated during each major outbreak are genetically distinct from each other, but all have been first identified in Sarawak, while some have spread to Peninsular Malaysia, Singapore and Australia.

The transmission of EV71 in a susceptible cohort is extremely rapid with only 4-6 weeks between first identification of an EV71 case in our sentinel clinics to peaking. The problem is that these outbreaks can drag on for many months after the peak, especially if the outbreak has not reached baseline before people start travelling or moving about the state (eg State elections in 2006, followed by Gawai holidays).

The Ministry of Science Technology and Innovation has just approved a grant to IHCM to develop a microarray which will allow simultaneous detection of all enterovirus serotypes in a single test. Current technologies are slow and tedious in that each virus serotype must be ruled out one by one. The diagnostic test that IHCM will develop is designed to detect the molecular signature of each serotype of enterovirus so that we can very quickly determine if an HFMD virus isolate is something we need to worry about or if it is one that only causes mild disease. This technology will allow rapid public health decisions and control of the sweeping EV71 outbreaks we have come to expect every few years in Sarawak.

Nanostructured Microbatteries

Project Leader: Associate Professor Dr. Pang Suh Cem
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In this high tech, high-paced world, there is an increasing demand for portable equipment for various tasks. Consumers are also demanding that these devices be reduced in size, low powered and battery operated to enhance portability. Due to this, there is the opportunity for developing microbatteries that are nothing more than thin films as a power source for these diminutive devices.

This research aims to produce nanostructured (a piece of human hair is 80000 nanometre across) Manganese Dioxide thin films as a power source. Manganese dioxide (MnO_2) is used as a depolarising agent in dry cell batteries.

The Assembly Process

Manganese dioxide (MnO_2) thin films were deposited on metal (nickel) coated plastic supports via a novel self-assembly horizontal submersion process at room temperature and pressure. The horizontal submersion process allowed the spontaneous assembly of manganese dioxide nanoparticles (in the form of stable colloidal suspension) directly onto nickel coated plastic supports to form uniform thin films. Films of various thicknesses were prepared by repeating the deposition process -- after the prior deposited layer was air-dried completely -- until the desired thickness is obtained.

Nanostructured Thin Films

We believe that the MnO_2 film deposition process was facilitated by active sites provided by the nickel metal coating on the surface of the plastic supports. They allowed a spontaneous self-assembly process which began with the adsorption of manganese dioxide nanoparticles onto the active sites, subsequent particles accumulation, clusters formation, and aggregation or self-organization of clusters, leading to the formation of nanostructured MnO_2 thin film on the supporting substrate. All these processes are believed to be driven by an active energy exchange in the nanoparticles.

Potential Behaviour Of MnO_2 Thin Films

The self-assembled manganese dioxide thin films are nanostructured and highly porous in nature. The characteristics of its form and structure are affected by deposition conditions such as temperature, duration of submersion, pH, concentration and ionic strength of MnO_2 suspension, as well as the heat treatment after the deposition process. As such, thin films with tailored form and structure can be prepared by exploiting these parameters.

These films exhibit high capacitative behaviour (ability to store electrical charge and energy) which is evident by the rectangular shape of cyclic voltamograms (CV) within the potential range of 0.0 to 1.0 V (versus SCE) in mild aqueous electrolyte [sodium sulphate (Na2SO4) salt solution].

In addition, these films exhibit high cycling stability and reversibility, even after prolonged cycling exceeding 1,000 cycles. The high capacitative behaviour of these MnO_2 thin films could be attributed to the proton (positive charge) exchange reactions during the charge and discharge cycling.

Maximum capacitance (charge storage) achieved for each of the prototypes ranged between 123 F/g and 141 F/g. All the prototypes exhibited high cycling stability without any loss in their capacitance, with an overall capacitance increment of about 2-4% even after 1,000 cycles. This observation indicates that the prototypes constructed in this study are electrochemically stable, and this stability is the most important criterion for electrochemical capacitor application.

This study shows that nanostructured MnO_2 thin films can be prepared by a novel self-assembly process which is simple, cheap and environmentally friendly. The high cycling stability and reversibility make these films suitable for construction of high power and energy density thin-film electrochemical capacitors. We believe that the nanostructures can be tailored for enhanced electrochemical properties by optimising the deposition parameters and conditions.

Technology-Based Management System for Oil Palm Plantation

Project Leader: Dr. Wang Yin Chai
Centre of Excellent for Image Analysis & Spatial Technologies
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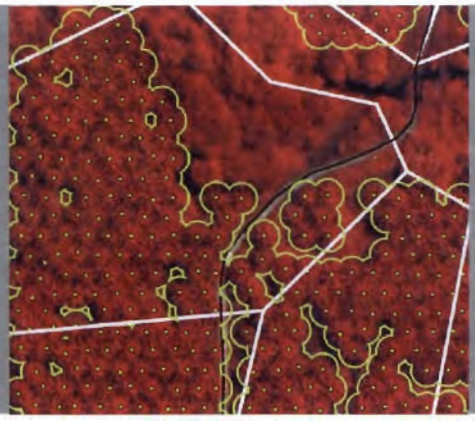
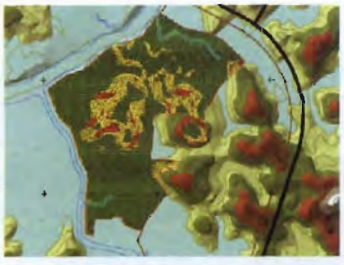


The increase in demands for palm oil has seen an increase in the number of oil palm estates in Malaysia, and its neighbouring countries, with a single company managing more than one plantation. With the involvements of huge land area, a technology-based plantation management system is critical for an efficient management of the plantation estate. An efficient technology-based management tools normally comprises 3 main components: Planning tools, Operation & Inventory Management, and Decision Support.



R1: Automated generation of terrace map for land clearing based on grid and terrace planting.

This research focuses on the development of various management tools for palm oil industry and its integration with the developed management system. At the end of this research, an integrated management system prototype will be developed based on the research findings. The 8 research modules/ parts for the whole project are divided into two phases. Phase I consist of two research modules (R1 and R5) and is presented in this report. The Phase II modules are listed below:

R2: Generation of agent-based path map based on guided sketch of spatial(area) information.

R3: Computerised information for Spatial-based Redistricting of oil palm plantation management.

R4: Rainfall estimation model for planning plantation activities using Neural Network.

R6: Oil Palm Fruit Bunch Identification and Recognition using CBIR.

R7: To develop computerised information from high-resolution images for extracting Oil Palm Prunes.

R8: Oil Palm Fruit Bunch Grading using Neural Network.

Apart from the planned modules, a web-based Geographical Information System (GIS) viewing system [similar to Google Earth] is developed for a computerised view of plantation related information.

In this module, spatial/ area features required for terrace generation was identified via satellite images. With the identified spatial features, work is underway to create and design graphic terrace map for identifying terrace grid, and developing terrace planting based on current practices. Nonetheless, graphic representations of the terrace map must adhere to the specification of terrace planting and generation base on industry standard. A case study was conducted at Saratok -- a newly developed area of 45 hectare for SALCRA. Satellite images of the area was acquired and stored. The mapping conversion was done and user requirement was also collected. Collected information will be integrated with graphic representation of the terrace map to automate and optimise the terrace generation for infrastructure planning. The main input from this module would be the topographic information which would identify slope and criteria for grid and terrace planting. The final programming of the terrace map is expected to generate terrace contour which would optimise planning and land clearance.

The texture and pattern of different vegetation satellite images were identified and collected. Image-processing techniques were used to analyse and model the signatures of the different vegetation obtained from high-resolution satellite images. Machine learning approach is used to study the patterns of these signatures and to correlate the featured images with various vegetations such as oil palm, sago, paddy, rubber, and pepper. The finding is the used to construct graphics of the vegetations' signature. Currently, suitable features to represent the vegetation signature of oil palm have been identified and a fully functional system employing this oil palm signature has been developed and commercialised. Tests conducted with the developed oil palm signature proved that it is highly accurate for the classification of oil palm vegetation. It enables the oil palm estate to be developed more efficiently with informations available on oil palm density, planted and unplanted area, estimated yields, effective planting area, budgeting etc. UNIMAS is currently negotiating with Sebayor Holding and Peladang Berdikari for big scale commercialisation of the developed system, Concomitantly, a proposal has been submitted to CRAUN (as requested by CRAUN) for the application of external funding to subsidise work on identifying and developing the sago signature for its growth stages identification.

R5: Vegetations signature modelling through high-resolution satellite images.

Aquaculture Potential of Ambal (Razor Clam) in Sarawak

Project Leader: Dr. Siti Akmar Khadijah Ab Rahim
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Introduction

A local seafood delicacy, popular on the menu of the many seafood restaurants in Sarawak is ambal or razor clams (Solen spp.). Unlike the clams with a more typical shell formation, the local name ambal normally refers to a unique species with a tube-like shell, gaping at both ends. With market demands for ambal at prices ranging from RM12 to 18 per kilogram, there is no denying its commercial value. However, despite of this, there is yet to be proper documentation on ambal's taxonomy, biology, and population dynamics. And with reports of depleting ambal stocks in its natural environment, further hard-pressed by fear of over-fishing, there is an urgent need to make a proper documentation of this species. The establishment of an ambal aquaculture would ensure the availability of this species for current and future market demands.

This project aims to gather vital information for the establishment of ambal aquaculture, maintenance of natural ambal stocks, and identification of species as potential bioindicators as well as endangered species. It focuses on four main research areas: (i) ecological assessment, (ii) diversity, morphological, and genetics study, (iii) larval biology and artificial seed production for aquaculture, and (iv) ecotoxicological and heavy metal study.

Population's Identification

Ambal or razor clams (Solen spp.) are soft bottom dwellers marine bivalves that prefer intertidal sandy beaches or sandy bars, especially in the western part of Sarawak, namely Buntal, Bako, Muara Tebas, and Asajaya. Therefore, these areas were selected for investigations on ambals.

The highest ambal's population density was recorded in Asajaya (Sambir), and the lowest in Muara Tebas (Kg. Pasir Putih). The study discovered that Ambals in Kuching Bay are divided into two Families, ie Solenidae (Ambal Biasa, Ambal Jernang and Ambal Riong)and Pharidae (Ambal Goyang and Ambal Celapa/ Selapa). Ambal Biasa was found at all study sites, and was the most abundant for each site. It was found to be widely distributed across the mudflat, whereas the other types preferred the mid-tide to low tide zones. In general, bigger and heavier ambal individuals were found in the low tide zone.

Based on their morphological features and preliminary molecular data, this study suggested three possible species of Solenidae ie Solen regularis (Biasa), S. digitalis (Jernang) and S. sarawakensis (Riong). A study on the distribution pattern of each of these Solen species is currently being conducted to gain more insight into their evolutionary pattern within the Bivalvia mollusks class.

Towards A Safe Sustainable Resources

Data comparison between 2005 and 2006 showed a 28% decline in ambal's population density in Serpan, Asajaya. In order to establish the cultivation of ambals towards sustaining and increasing their numbers, investigations on ambal's reproductivity activity, induced spawning and feeding techniques were conducted.

By monitoring the gonad development as an indicator of their reproductive activity (Gonadal Condition Index), the spawning period for ambal is predicted to be between March to August. There seems to be a resting period from November to January as no gonad was observed in ambals during this period.

Several trials of induce spawning and brood stocks handling were conducted with promising results. Larval development study is currently in its early stage, and further study on ambal feeding behaviour is being conducted. To date, a species of microalgae from ambal habitat has been successfully cultivated and is currently being used as feed for the brood stocks.

Ambals feeding behaviour is also an important reason for ambals to be cultured. This is to ensure that they are safe for consumption. Being filter feeders, there is a high tendency for ambals to accumulate in their system toxic compounds that pollute their habitats, making them potentially dangerous for consumers. The present study showed that accumulation of metal compounds varied between clam size, and tidal zones did not significantly influence the metal distribution pattern. However, determination of the level of heavy metals showed that ambals are still safe for human consumption. Study on the level of organic pollutants in ambals and the sediment surrounding them is still in progress.

Equally important for the success of ambals aquaculture is identification of suitable culture areas. By establishing techniques to mass-produced ambal juveniles for release into their natural habitats, we are looking at increasing or at least sustaining this invaluable natural resource.

NETWORKING

International Research & Education Network

UNIMAS has been actively involved in numerous international partnerships and collaborations for the promotion of joint research and education programmes. Below are some highlights of these on-going international collaborations.

STRAPEAT (Strategies for Implementing Sustainable Management of Peatlands in Borneo – http://www.strapeat.alterra.nl)

STRAPEAT is a recently completed project supported by EU. The project was aimed at promoting wise use of tropical peatlands by integrating biophysical, hydrological and socio-economic data within strategies for sustainable management. The project will contribute positively to poverty alleviation, protection of the environment and improvement of the quality of life.

PEATWISE (Educational Tools for Sustainable Management of Peatlands in the Humid Tropics - http://www.peatwise.alterra.nl)

PEATWISE is an educational (AsiaLink) project. The overall objective of the project is to develop a curriculum on the sustainable development of peatlands by the introduction of innovative educational methods and tools, in order to promote the wise use of resource and to enhance sustainable economic development, particularly in the areas of Sarawak and Central Kalimantan.

RESTORPEAT (Restoration of Tropical Peatland to Promote Sustainable Use of Renewable Natural Resources – www.restorpeat.alterra.wur.nl)

The RESTOPEAT project is aimed at providing access to existing knowledge and expertise, and conducting targetted research on restoration of tropical peat swamp forest to promote sustainable livelihoods of local people.

CARBOPEAT (Carbon-Climate-Human Interactions in Tropical Peatlands)

CARBOPEAT is aimed at promoting understanding of carbon-climate-human-interactions in tropical peatlands, focusing on vulnerabilities of carbon pools, linked to mitigation of greenhouse gas emissions, through the wise use of natural resources.

Contact Person: Prof. Murtedza Mohamed <ted@cans.unimas.my>

Computerized Automative Technology Reconfiguration System For Mass Customization (Cater)

UNIMAS is collaborating with European and South-East Asian Partners such as Damai Sciences, Volvo Technology Corporation, Centro Ricerche Fiat, Universität Stuttgart, University of Nottingham on the Computerized Automative Technology Reconfiguration System for Mass Customization (CATER) project. The amount of funding received by UNIMAS is RM 825,000.

CATER will support the automotive industry needs by building the car that the customer wants, as opposed to the old business model where the customer has limited choices in selecting what they want. The Faculty of Computer Science and Information Technology, UNIMAS will oversee the development of a teardown database system containing 3D-model data of vehicle components which can be retrieved efficiently.

Contact Person: Assoc. Prof. Dr. Wang Yin Chai <ycwang@fit.unimas.my>

The UNIMAS-UNISA & UNIMAS-IIQM Partnerships

The Department of Nursing in UNIMAS has established important academic and research partnerships with the University of South Australia (the UNIMAS-UniSA Link) and the University of Alberta (the UNIMAS-IIQM Link).

The UNIMAS-UniSA link was first established in 2005 for the purpose of student exchange between the two universities. To date, six undergraduate nursing students from the University of South Australia have studied in UNIMAS.

The UNIMAS-IIQM Link established in 2005 for the purpose of promoting qualitative research and education. UNIMAS is the only university in Malaysia that has been accepted by the IIQM as its Cooperating Site. The UNIMAS Cooperating Site is collaborating with the University of South Australia and IIQM to hold the first Biennial International Conference on Evidence-Based Nursing in 2008.

Contact Person: Dr Chang Kam Hock <khchang@fmhs.unimas.my>

BORNEO-KALIMANTAN SCHOLARS NETWORK FOR STUDIES ON SOCIAL TRANSFORMATION

This is a tremendous wealth of knowledge amongst researchers of Malaysia, Indonesia and Brunei but a lack of academic and intellectual interactions between Sarawak, Sabah and the four provinces of Kalimantan and Brunei. The Institute of East Asian Studies of (IEAS) UNIMAS with the support of

Faculty of Social and Political Sciences, Universitas Tanjungpura, Pontianak, West Kalimantan, Faculty of Social Sciences, UNIMAS and FISIP, UNLAM, Banjarmasin, South Kalimantan initiated a common forum in order to increase intellectual exchanges.

A series of conferences were organised: 2005 in UNIMAS, Kota Samarahan; 2006 in Universitas Tanjungpura, Pontianak, West Kalimantan; 2007 in Universitas Lambung Mangkurat, Banjarmasin, South Kalimantan.

Contact Person: Prof Abd Halim Ali <aahalim2@ieas.unimas.my>

UNIMAS-USF EDUCATION AND RESEARCH PARTNERSHIP

In 2000, UNIMAS had the opportunity to receive Prof. Dr. Michael Churton from the University of South Florida (USF) as a visiting Professor under the Fulbright Scholar scheme. As a result of the networking that was established with Prof. Dr. Michael Churton, the University of South Florida and UNIMAS signed a Memorandum of Understanding in 2002 for collaborative research and education opportunities. This include academic and research exchanges of faculty and students across campus and operationalizing the UNIMAS-USF Research Center based at UNIMAS. The proposed Center will address the immediate needs and interests of both Universities. Contact Person: Prof Peter Songan <songan@calm.unimas.my>

SPLIT PH.D. RESEARCH TRAINING WITH THE UNIVERSITY OF MELBOURNE, AUSTRALIA

There is an agreement for capacity building through staff research training and collaborative research between seven universities in Malaysia and the University of Melbourne (UMEL).

The primary objectives of this agreement are to enhance capacity of Malaysian higher education by providing PhD research training at UMEL to selected candidates from Malaysian universities, and to foster collaborative research and exchange between academic staff of the Malaysian universities and UMEL. Under the Split Ph.D Research Training (SPRT) students will be supervised by supervisor(s) from UMEL and from the respective Malaysian university. The period of residence at UMEL shall normally be a minimum of 50% of the four year course of study.

The PhD qualification gained under SPRT shall be awarded by UMEL.

Contact Person:

Assoc. Prof. Dr. Kasing Apun <kasing@frst.unimas.my>

MOU SIGNED

29 May 2007: Faculty of Resource Science & Technology, UNIMAS and Museum of Natural Science, Louisiana State University (Baton Rouge) USA. Main objective: To embark on joint survey of birds in montane areas of Sarawak.

14 May 2007: Centre for Information & Communication Technology Services, UNIMAS and Telekom Malaysia Berhad. Main objective: Provision of technical assistance for upgrading of network bandwidth at UNIMAS.

PRODUCTS AND TECHNOLOGY TRANSFER

Versatile Mobile Emergency Aids Vest For Paramedic and Rescue Team

Researchers: Musdi Hj. Shanat & Maizatul Nurhuda Saadon
Faculty of Applied and Creative Arts
Email: smusdi@faca.unimas.my

First Aids kit is an essential tool (pre-hospital care) for assisting injured patients during emergencies. The versatile mobile emergency aids vest is a result of an extensive study by a team of researchers at UNIMAS of existing first aids kits or tools design and weaknesses. Conventional emergency aids kits commonly come in carrying cases or boxes which are too bulky and cumbersome in some emergency situations such as climbing tall buildings and maneuvering narrow passages. The unique design of the vest allows paramedics to wear them as with any other ordinary vest with their hands free to lift, move and secure patients. The ergonomics and ease-of-use design makes it easier to wear and to drop in an instant if necessary.

The vest has been awarded the "Best of the Best" Award and a gold medal at the Malaysian Technology Exhibition 2007 (MTE2007) in Kuala Lumpur in March 2007, which was the top award from among over 300 exhibits.

Pilot-Scale High Speed Fermentation of Ethanol for Fuel from Sago Utilizing the 'Ishizaki Process®'

Researchers: Kopli Bujang, Ayaaki Ishizaki, Ang Shin Ying, Lenny Niyong & Liza Minah
Faculty of Resource Science and Technology and New Century Fermentation (NECFER) Research Co. Ltd. Japan
Email: bkopli@pps.unimas.my

This project involves the production of ethanol for fuel from sago using the 'ishizaki process', a proven and patented procedure (Japanese Patent Tokugan 2005-269031) named after the inventor, Prof. Emeritus Ayaaki Ishizaki, formerly of Kyushu University, Fukuoka, Japan. This pilot-scale project is a result of over 10 years of collaboration between Professor Ishizaki and UNIMAS researchers.

Crude sago slurry or dried sago starch is liquefied using Termamyl and saccharified using Dextrozyme – a procedure developed earlier at UNIMAS. The microorganism used in this process is isolated from nature and used without any genetic manipulation. The process of ethanol fermentation is a well-researched field in our Biochemistry Lab at Unimas and Microbial Technology Lab at Kyushu University, Japan. The initial culture conditions and the optimum parameters for both batch and continuous experiments (2L scale) in ethanol fermentation is well established.

Pilot-scale fermentation process will be performed using a 3,000L fermentor. From here, a daily production of 1.16kL of ethanol can be generated from only 80 sago logs . The 'ishizaki process' ensures a steady flow of ethanol even after 100 days of continuous operation at a rate never achieved elsewhere before. The average sago mill in Sarawak consumed about 2,000 logs/day, producing 20-25 tons of sago starch. In this respect, this project will assist the State into the possibility of expanding into a commercial scale (10,000L/day) process which inexorably will increase the income of local sago farmers and sago starch processors while concomitantly expanding their market opportunities globally. The Malaysian government through the Ministry of Science, Technology and Innovation (MOSTI) has recognized and awarded this project with a research grant (Technofund) of more than RM10 million in April 2007 to start-up the pilot scale production plant in Sarawak.

iCompetent's Mobile Psychologist System

[iTalentSuite & iPowerSuite]

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Do you encounter difficulties in deciding who to employ for your organization? iCompetent employment tool may be the answer to your dilemma. iCompetent is a trademarked psychological instrument developed by a team of psychologists, counselors and medical experts from UNIMAS. It is a speedy and efficient tool which utilizes theories and methods of psychological tests to unravel the hidden talents of individuals, which may not be so obvious from conventional face-to-face interviews. iCompetent is an efficient computer and internet based technology, which enables organizations to carry out selection of the best candidates at the press of a button, so to speak! The inner personal competencies of think-feel-act of job applicants that you are looking for can be quickly revealed, and this saves your organization time and money. Since this is an internet based technology, ,iCompetent also allows thousands of job application from all over the world, 24 hours a day, even while you are closed for business!

Award-Winning Inventions by UNIMAS Researchers

The following are products and inventions of UNIMAS researchers, which have won awards and medals at numerous exhibitions, locally and internationally, in 2005 - 2007. Further enquiries on these products can be directed to RIMC UNIMAS 082-581037 (Dr. Awangku Abdul Rahman) or pyaarahman@rimc.unimas.my.

1. Mobile Emergency Aid Kit for Paramedic and Rescue Team
2. Compact Rescue Stretcher
3. Unmanned Underwater Search Craft
4. Magic Finger: An Intelligent Free Hand Input Device
5. A High Performance Cost-Effective Oil-Water-Solids Separator
6. AeroJac: Jackets for Motorcyclist
7. Bioresist: An alternative Masking Formula for Batik Production
8. Interactive Digital Wayfinding Application
9. Comfy Pants: Practical Pants for Children With Special Needs
10. Belly Basic: Maternity Dress With Practical Opening
11. A New Method of Reconstructing the Humerus for Bone Cancer
12. Attire for Stroke Patients
13. Magic Board-Games: A New Way of Games Entertainment
14. Bio-composite Sago Bark Waste for Interior Decoration Products
15. e-Bario: ICT for Rural Community
16. Easywear: Patient Attire in Hospital Wards
17. Agriculture Support System and Field Tools: Oil Palm Tree Crown Delineation and Enumeration Using Ikonos Satellite Images
18. Image Finder: A Content Based Image Retrieval System
19. The Shell of Placuna Placenta Linnaeus: A Potential Material for Interior Products
20. The Bario Lakuh Digital Library
21. Baju Kurung for Breast Feeding
22. Informative Design on Textiles for the Visually Impaired Persons
23. Fibreboard from Sago Waste using Natural Enzyme
24. Production of Lactic Acid from Sago
25. An Assistive Device for Increasing the Rate of Union of Open Fractures of the Tibia.
26. A Circular Separator for Removal of Oil & Grease from Kitchen Wastewater Award-Winning Inventions by UNIMAS

RESEARCH TOOLS AND TECHNOLOGIES

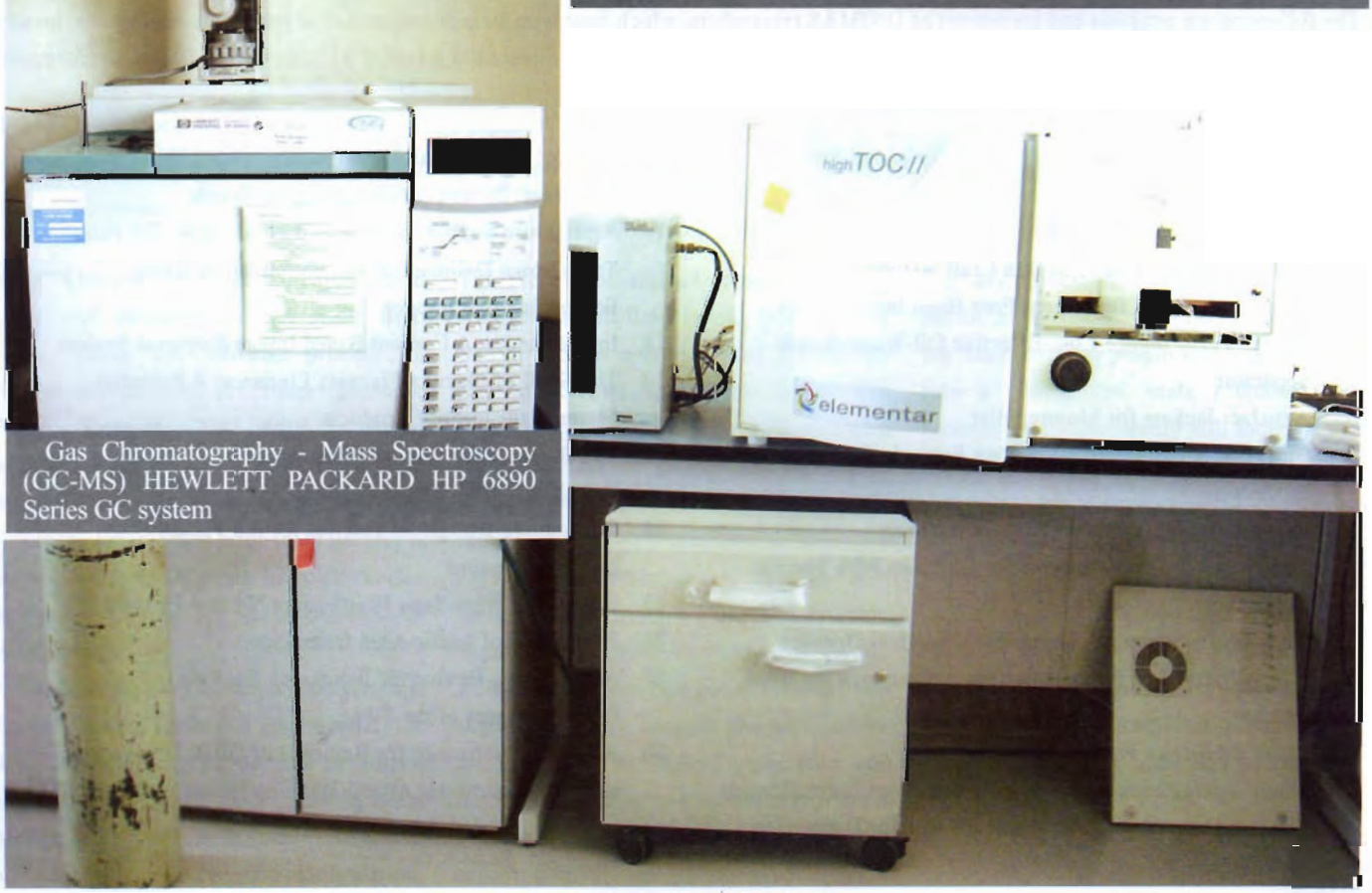
Central Instrument Laboratory
Faculty of Resource Science and Technology

The Faculty of Resource Science and Technology (FRST), under Phase 1 of the Unimas development plan, had acquired state-of-the-art scientific instruments which are comparable to other research universities in the world. These high-end equipment include Electron Microscope (SEM), Nuclear Magnetic Resonance (NMR), Inductively Coupled Plasma – Mass Spectrometry (ICP-MS), Total Organic Carbon Analyzer, High Performance Liquid Chromatography (HPLC), Chromatography – Mass Spectroscopy (GC-MS) and Auto-Analyzer. FRST researchers and postgraduate students are expected to perform high quality investigation in chemistry, material science and biology. These instruments will be managed under Central Instrument Laboratory and will provide service and consultation for industry and private analytical work.

Electron Microscope
JEOL, JSM 6390LA

Gas Chromatography - Mass Spectroscopy (GC-MS) HEWLETT PACKARD HP 6890 Series GC system

Total Organic Carbon Analyzer
High TOCII ELEMENTAR



SEMINARS AND CONFERENCES

3rd Borneo-Kalimantan Interuniversity Conference

The Borneo Kalimantan Interuniversity Conference is an annual event, organised jointly by Institute of East Asian Studies and Faculty of Social Sciences, UNIMAS in collaboration with Universitas Tanjungpura, Pontianak, Universitas Lambung Mangkurat, Banjarmasin and other Borneo-Kalimantan Scholars Network for Studies on Social Transformation. The conference primary aim is to provide an academic forum and intellectual meeting ground for scholars, academics and the public, particularly those of Borneo-Kalimantan origins, who are concerned with issues of social transformation. The 3rd Borneo-Kalimantan Conference, held at Universitas Lambung Mangkurat 15 – 17 June 2007 discussed 60 research papers under the theme "Reflecting on and Formulating Development Agendas".

5th International Conference on IT in ASIA (CITA'07)

CITA is a biennial flagship conference of the Faculty of Computer Science & IT, UNIMAS. CITA'07 was held in Kuching on 9 – 12 July 2007, with the theme "Social Computing: Engaging Communities". Over 60 quality papers, shortlisted from nearly 170 submissions, were read and discussed. The papers focused on the transformations brought about by advancements in ICT, from the availability of access of resources and computing power any time any where, to the provision of a platform where people from all over the world collaborate, work, play and even network socially. CITA'07 was co-sponsored by the ICT Unit of the Chief Minister's Department of Sarawak, Global Information & Telecom-munication Institute of Japan and Malaysian Communications & Multimedia Commission.

Hybrid+ism 2007

Hybrid is an exhibition of artworks and products by the staff and alumni of the Faculty of Applied & Creative Arts, UNIMAS. Hybrid refers to high quality combination of artistic imagination, skills and creativity beyond the boundaries of conventional artforms. Following the remarkable success of D'NA->Hydrid'05 at the National Art Gallery, Hybrid+ism'07 was held at the Sabah Art gallery between 12 Jun – 9 July 2007 showcasing the works of 26 artists.

Asia Pacific Marketing Conference 2007 (APMC 2007)

The Faculty of Economics and Business, Universiti Malaysia Sarawak will be hosting the APMC 2007 on 2 – 3 November 2007 at Holiday Inn Resort Damai Beach Kuching, Sarawak. The aim of the Conference is to provide opportunities for professionals, practitioners and academicians to share their insight on the development and challenges in all areas related to the field of marketing. Details are available at http://www.unimas.my/APMC2007/. Contact Person: sfathan@feb.unimas. my or drernest@ feb.unimas.my

1st Engineering Conference in Energy and Environment (ENCON 2007)

ENCON'07, organized by the Faculty of Engineering, UNIMAS is aimed sharing the frontier knowledge and advances in the areas of energy and environment among the professionals and researchers in these disciplines. It will be held on 27 – 28 December 2007 at Crowne Plaza Riverside Hotel, Kuching, Sarawak. Areas of special interest of this conference include energy efficiency improvement, energy-intensive process control systems, and new technologies in power generation and distribution. Details are available at http://www. feng.unimas.my/encon2007/. Contact email: encon2007@ feng.unimas.my

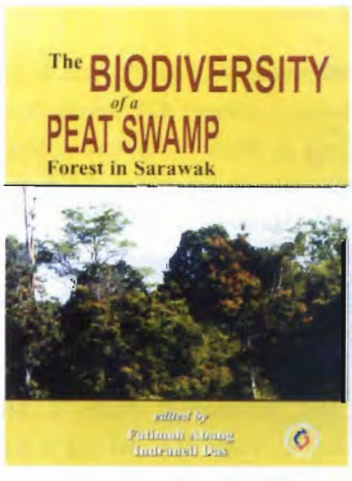
PUBLICATIONS

The following are books and selected international journal papers (with impact factors) written by the academic staff of UNIMAS, published or released in 2007.

Books

Fatimah A. Butterflies of Malaysian Borneo - A Pocket Guide. UNIMAS Publications. ISBN 983-9257-65-X; 130 pp.

Fatimah A & Das I (eds). The Biodiversity of a Peat Swamp Forest in Sarawak. UNIMAS Publications. ISBN 983-9257-45-5; 142 pp.



Cheng Sim H (ed). Village Mothers, City Daughters - Women and Urbanization in Sarawak. Institute of East asian Studies, Singapore. ISBN 978-981-230-415-5. 150 pp.

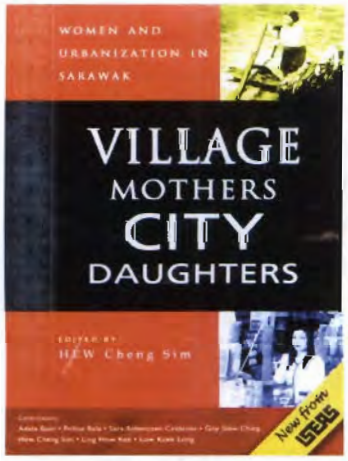
Roslan A & Norsiah F. "Pembangunan Kerohanian dan Refleksi Budaya Masyarakat Melayu". UNIMAS Publications. ISBN 983-9257-61-7. 125 pp.

Hong KS, Napsiah M, Liau TL, Abang Ekhsan AO (eds). Contemporary Issues in Education by Persatuan Perkembangan Profesionalisme Pendidikan Sarawak.

Kuching. ISBN 978-983-3147-08-3. 129 pp.

Das I. A pocket guide. Amphibians and reptiles of Brunei. Natural History Publications (Borneo) Sdn Bhd. Kota Kinabalu. ISBN. 983-812-119-3; 200 pp.

Hong KS, Liau TL, Law L, Abang Ekhsan AO (eds). Rethinking teacher education: A compilation of papers. Persatuan Perkembangan Profesional-isme Pendidikan Sarawak. Kuching. ISBN 978-983-3147-07-6. 211 pp.



International Journal Papers (with impact factor)

Alhady M, Ngo CT, Tan AK, Swethadri GK, Chua CN. 2007. Palpebral pleomorphic rhabdomyosarcoma in a teenager. Eye: 21(2):291-3.

Alhady M, Ngo CT, Tan AK, Swethadri GK, Chua CN. 2007. Use of 18-gauge intravenous catheter needle for frontalis suspension in children with congenital ptosis. Eye: 21(2):308-9.

Annuar BP, Liew CK, Chin SP, Ong TK, Seyfarth MT, Chan WL, Fong YY, Ang CK, Lin N, Liew HB, Sim KH. 2007. Assessment of global and regional left ventricular function using 64-slice multislice computed tomography and 2D echocardiography: A comparison with cardiac magnetic resonance, Eur J Radiol (2007), doi:10.1016/j.ejrad.2007.03.008.

Bickford D, Lohman DJ, Sodhi NS, Ng PKL, Meier R, Winker K, Ingram K, Das I. 2007. Cryptic species as a window on diversity and conservation. Trends in Ecology and Evolution 22(3):148–155.

Das I, Austin CC. 2007. New species of Lipinia (Sauria: Scincidae) from Borneo, revealed by molecular and morphological data. Journal of Herpetology 41(1):60–70.

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Ooi MH, Solomon T, Podin Y, Mohan A, Akin W, Yusuf MA, del Sel S, Kontol KM, Lai BF, Clear D, Chieng CH, Blake E, Perera D, Wong SC, Cardosa J. 2007. Evaluation of different clinical sample types in diagnosis of human enterovirus 71-associated hand-foot-and-mouth disease. J Clin Microbiol. 45(6):1858-66. Epub 2007 Apr 19.

Pang SC, Suk-Fun C, Anderson MA. 2007. Redox equilibria of iron oxides in aqueous-based magnetite dispersions: Effect of pH and redox potential. Journal of Colloid and Interface Science 311: 94-101.

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Perera D, Yusof MA, Podin Y, Ooi MH, Thao NT, Wong KK, Zaki A, Chua KB, Malik YA, Tu PV, Tien NT, Puthavathana P, McMinn PC, Cardosa MJ. 2007. Molecular phylogeny of modern coxsackievirus A16. Arch Virol. 152(6):1201-8. Epub 2007 Feb 19.

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Po-Teen L, Shigeru S, Chu VT, Pham TT, Nguyen Thi MH, Yoshinobu T, Makoto Y, Atsushi K, Kazuhiko K, Takehiko O. 2007. Toxic Alexandrium minutum (Dinophyceae) from Vietnam with new gonyautoxin analogue. Harmful Algae 6: 321-331.

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Tan CS, Cardosa MJ. 2007. High-titred neutralizing antibodies to human enterovirus 71 preferentially bind to the N-terminal portion of the capsid protein VP1. Arch Virol. 152(6):1069-73. Epub 2007 Feb 23.

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NEXT ISSUE:
OUTREACH Vol. 1 No. 2 (Dec 2007)

1 **Highlights of Research Projects**
- Studies on Malaria Parasite Plasmodium knowlsi in Human and Monkeys
- Universal Design Elements and Enhancement of Indigenous Artworks
- Grey Water Treatment (Ecological Sanitation Project)
- Biomas-to-Fuel Conversion

2 **Products and Technology Transfer**
- UNIMAS-ESPSB: Bioremediation of Crude Oil Sludge
- UNIMAS-MIMOS: Language Technology Productisation
- UNIMAS-FAMA: Study on the Supply Chain in Farmers' Market in Sabah and Sarawak
- UNIMAS-Rural Community: Very low-Cost Hydroelectric Power Generation System for Rural Community

3 **Seminars & Conferences**
- International Conference on Natural Resources and Environmental Management & Environmental Safety and Health (NREM & ESH) 2007
- 2nd International Conference of Applied & Creative Arts (ICACA) 2008
- 1st Biennial International Evidence-Based Nursing Conference

4 **Research Tools & Technologies**
- Prototyping facilities at the Faculty of Engineering, UNIMAS
- Central GIS lab at UNIMAS